REMARKS

Claims 1 through 13 are currently pending in the application.

This amendment is in response to the final Office Action of June 26, 2002.

Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al.(U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claims 9, 10 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783), Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 10 above, and further in view of Kawakubo (U.S. Patent 5,889,696).

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783), Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 10 above, and further in view of DeBoer et al. (U.S. Patent 5,930,106 and Derwent copy, under "Novelty").

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Rejections Under 35 U.S.C. § 103(a)

Hsia in view of Wolf and Haller

Claims 1 through 10 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506).

Applicants submit that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

Hsia teaches a capacitor cell in a memory device that has enhanced side-wall area by depositing plurality of oxide layers wherein each layer is deposited by a deposition technique *different* than that used for depositing its immediate adjacent layers. Each alternating layer is deposited by a different technique selected from a thermal CVD technique and a plasma CVD technique and each layer has a density that is different than its immediately adjacent layers. The layers are next etched by an etchant having different etch selectivity for the different oxide layers producing a corrugated configuration (See Col. 2, lines 24-51). The etchant used has a higher selectivity toward the oxide layers formed by the plasma CVD method and a lower selectivity toward the oxide layers formed by the thermal CVD method. Because the oxide layers have densities due to the different deposition methods, the layers are etched differently leading to a corrugated configuration of side walls. Clearly, the corrugated structure of walls is formed because the layers are deposited using alternating deposition methods and etched selectively due to the use of a very highly selective etchant which can recognize the differences in those deposition methods (See Col. 6, lines 19-27).

Wolf teaches that borophosphosilicate glass or BPSG finds wide use as the pre-metal dialectric layer between polysilicon and metal and dielectrics between stacked capacitors and metal in DRAMs because of its low glass flow temperature properties and reduced stress (See pages 200-201).

Haller teaches doping the BPSG material of the nonconducting layer of a semiconductor integrated circuit with germanium to increase the selectivity of the etch. Thus, the material forming the nonconducting layer and doped with germanium is etched at a faster rate (See Abstract and Col. 2, lines 35-38, 65-67).

It is asserted that a combination of Hsia, Wolf and Haller is possible in the Final Rejection. It is suggested that the oxide layers in Hsia could be modified so that they are made of BPSG material taught by Wolf and germanium BPSG material taught by Haller. The motivation to combine the references as indicated appears to stem from low glass flow temperature properties, and reduced stress for the selection of BPSG and faster etch rates for the selection of

germanium BPSG. However, when considering the *entire* deposition and etching procedure to form the corrugated structure in the walls of a capacitor cell, as taught by Hsia, it is respectfully submitted that the oxide layers in Hsia would not be modified to include alternating layers of BPSG material and germanium BPSG material. Hsia teaches *away* from such modification. Hsia teaches oxide layers that are deposited according to different deposition methods and then etched selectively using a selective etchant that can recognize the differences in those deposition methods. Due to this type of selectivity, corrugated structure in the side walls of a capacitor cell is formed. Modifying the oxide layers in Hsia to include BPSG material and germanium BPSG material during the deposition procedure would interfere with the etching procedure specifically disclosed in Hsia. Hsia specifically discloses the use of *non-doped* silicate glass layers disposed using alternating deposition methods. The acid etchant is next used in order to form the corrugated cell walls because the etchant recognizes the differences in the deposition methods of the non-doped silicate glass layers and the resulting differences in densities of the layers. Using a germanium BPSG material for one of the two alternating layers would interfere with the acid enchant's differentiation between the two silicate glass layers which is based exclusively on the different deposition methods used. Using germanium BPSG material for one of the two alternating layers would affect the layer's etch rate and therefore, would affect the selectivity of the acid etchant.

In view of the above discussion, Applicants submit that it is "improper to combine references where the references teach away from their combination." MPEP § 2145(X)(D)(2) (citing *In re Grasselli,* 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). The disclosed deposition and etching procedure with the use of an acid etchant which depends on specific types of layers using specific deposition methods clearly show that Hsia reference teaches *away* from its proposed combination with Wolf and Haller. Applicants further submit that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.,* 220 U.S.P.Q. 303 (Fed. Cir. 1983), *see also* MPEP § 2141.02.

Therefore, it is respectfully submitted that consideration of Hsia in *entirety* teaches *away* from any combination thereof with Wolf and Haller and vice versa, as well as from the subject matter recited in the currently pending claims of the above-referenced application. In other words, the three references, Hsia, Wolf, and Haller, when considered in entirety, all fail to provide any motivation for the attempted combination. Accordingly, any combination of the cited prior art cannot and does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed invention. It is respectfully submitted that claims 1 through 10 and 13 are allowable over the combination of Hsia, Wolf and Haller. Accordingly, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 1 through 10 and 13 be withdrawn.

Hsia in view of Wolf and Haller and Kawakubo

Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783), Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 10 above, and further in view of Kawakubo (U.S. Patent 5,889,696).

Claim 11 is allowable, among other reasons, as depending either directly or indirectly from claim 9, which should be allowed.

Therefore, it is respectfully requested that the 35 U.S.C. § 103(a) rejection of claim 11 be withdrawn.

Hsia in view of Wolf and Haller and DeBoer

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783), Wolf et al. (ISBN 0-9616721-6-1) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 10 above, and further in view of DeBoer et al. (U.S. Patent 5,930,106 and Derwent copy, under "Novelty").

Claim 12 is allowable, among other reasons, as depending either directly or indirectly from claim 9, which should be allowable.

Therefore, it is respectfully requested that the 35 U.S.C. § 103(a) rejection of claim 12 be withdrawn.

Applicants request entry of this amendment for the following reasons:

The amendment is timely filed.

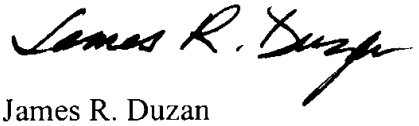
The amendment does not require any further search or consideration because no claim has been amended.

The amendment clearly sets forth the reasons for each claim being allowable over the cited prior art.

In summary, Applicants submit that claims 1 through 13 are clearly allowable over the cited prior art for the reasons set forth herein.

Applicants request the allowance of claims 1 through 13 and the case passed for issue.

Respectfully submitted,



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